L37: Entry 3 of 17 File: USPT Nov 19, 2002

DOCUMENT-IDENTIFIER: US 6484245 B1
TITLE: Apparatus for and method of accessing a storage region across a network

Brief Summary Text (2):
The present invention relates to storage control apparatus with ANSIX3T11-standardized fiber channels as an interface with its upper-level or "host" computers, and more particularly to a storage controller device which is employable in a computer system including a host computer and a storage control device plus a storage unit operable under control of the storage controller and which is for elimination of unauthorized access attempts upon issuance of a request to access the storage unit as sent from the host computer to the storage controller.

Detailed Description Text (46):
Now, assume for example that the host computers 10, 20 are capable of getting access to the disk array subsystem 50 whereas the host computer 30 is incapable of accessing disk array subsystem 50. Assume also that the N_Port_Name is such that the host computer 10 is HOSTA, host computer 20 is HOSTB, and host computer 30 is HOSTC. Suppose that the port of the fiber channel control unit 41 of the storage controller 40 is CTL0P0. If this is the case, the resulting log-in request control table 130 is as shown in FIG. 6.,

Detailed Description Text (63):
Assume here that the LU0 (51) is accessible from the host computer 10 via a port of the fiber channel control unit 41 of the storage controller 40 whereas the LU1 (52) is accessible from the host computer 20 via a port of fiber channel control unit 41 of storage controller 40. Suppose that regarding the N_Port_Name, the host computer 10 is HOSTA while host computer 20 is HOSTB. Imagine that a port of fiber channel control unit 41 of storage controller 40 is CTL0P0. If this is the case, an I/O request control table 140 is as shown in FIG. 8.

Detailed Description Text (82):
It must be noted that the storage device under control of the fiber channel connection storage controller should not exclusively be limited to the disk array subsystem stated supra, and the principles of the present invention may alternatively be applicable to any systems employing an optical disk drive, magneto-optical disk drive and magnetic tape storage as well as library apparatus including one or several of them in combination.

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L37: Entry 4 of 17 File: USPT Jul 23, 2002

DOCUMENT-IDENTIFIER: US 6425036 B1
TITLE: Storage router and method for providing virtual local storage

Detailed Description Text (12):
FIG. 4 is a block diagram of one embodiment of storage router 56 of FIG. 3. Storage router 56 can comprise a Fibre Channel controller 80 that interfaces with Fibre Channel 52 and a SCSI controller 82 that interfaces with SCSI bus 54. A buffer 84 provides memory work space and is connected to both Fibre Channel controller 80 and to SCSI controller 82. A supervisor unit 86 is connected to Fibre Channel controller 80, SCSI controller 82 and buffer 84. Supervisor unit 86 comprises a microprocessor for controlling operation of storage router 56 and to handle mapping and security access for requests between Fibre Channel 52 and SCSI bus 54.

CLAIMS:

6. The storage router of claim 2, wherein the Fibre Channel controller comprises: a Fibre Channel (FC) protocol unit operable to connect to the Fibre Channel transport medium; a first-in-first-out queue coupled to the Fibre Channel protocol unit; and a direct memory access (DMA) interface coupled to the first-in-first-out queue and to the buffer.

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L37: Entry 1 of 17 File: USPT Dec 10, 2002

DOCUMENT-IDENTIFIER: US 6493825 B1
TITLE: Authentication of a host processor requesting service in a data processing network

Detailed Description Text (25):
The problem of restricting the set of volumes that can be seen by any one host is solved by a method of named groups and/or a method of virtual ports. The method of named groups is applicable to all Fiber Channel topologies for the connections of hosts to one or more ports of a storage controller. The method of virtual ports causes at least one port of the storage controller to appear as if it were a port of a fabric. The method of virtual ports could cause the port of the storage controller to appear as if it were a Fibre-Channel FL_Port (a port in a loop that is part of a fabric), E_Port (a port that is an interlink between two switches), or F_Port (fabric port). The two methods could be used at the same time in the same storage controller. In either the method of named groups or the method of virtual ports, the limited set of volumes accessible to a host can be specified by a list of logical volumes in the limited set, or by a procedure that defines the limited set of volumes. An example of a specification for a procedure that defines the limited set of volumes is a vector defining what will be called a "disk spread."

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L37: Entry 17 of 17 File: USPT Apr 27, 1999

DOCUMENT-IDENTIFIER: US 5898828 A
TITLE: Reduction of power used by transceivers in a data transmission loop

Drawing Description Text (7):
FIG. 5 is a block diagram illustrating the use of Fiber Channel Arbitrated Loops for interconnecting disk drives in an array to disk adapters in a storage controller;

WEST Search History

DATE: Tuesday, December 10, 2002

Set Name side by side	Query	Hit Count	Set Name result set
	DB=USPT; PLUR=YES; OP=ADJ		
L37	L35 near10 storage controller	17	L37
L36	L35.bsum.	871	L36
L35	fibre channel	2062	L35
L34	6275263.pn. and stream$	0	L34
L33	(advanced streaming format)	9	L33
L32	(advanced streaming format or asf)	1242	L32
L31	L28 near10 compress$	4	L31
L30	L28.ti.	11	L30
L29	L28.ti,ab.	21	L29
L28	media converter	91	L28
L27	l1 near5 format$ near5 (chang$ or modif$)	0	L27
L26	L22 near10 l1	0	L26
L25	L22 near5 without	7	L25
L24	L22.ti,ab.	7	L24
L23	L22 near15 l8	0	L23
L22	stream$ near5 format$ near5 (chang$ or modif$)	137	L22
L21	L20 naer15 l8	0	L21
L20	format modification	88	L20
L19	compress near5 stream$ near5 format$	19	L19
L18	L16 near10 l8	1	L18

L17	L16 near5 need$	35	L17
L16	download$ near5 complet$	1436	L16
L15	L13 near5 (stream$)	9	L15
L14	L13 near5 (universal or common or generic)	1	L14
L13	l8 near5 format$	156	L13
L12	5710895[uref]	5	L12
L11	L10.ti,ab.	16	L11
L10	L8 near10 (live or real time or realtime)	417	L10
L9	L8.ti.	57	L9
L8	(video or meia or multimeia) near3 (captur$)	4093	L8
L7	usb near3 video near3 (captur$ or adapter or converter)	12	L7
L6	usb near3 video near3 (captur$ or adapter or convertor)	11	L6
L5	(media or multimedia) near3 convertor	22	L5
L4	l1 near10 format$	6	L4
L3	(streamable media)	2	L3
L2	(immediately streamable media)	0	L2
L1	(immediately streamable media or ism)	1268	L1

END OF SEARCH HISTORY

DOCUMENT-IDENTIFIER: US 6493750 B1
TITLE: Command forwarding: a method for optimizing I/O latency and throughput in fibre channel client/server/target mass storage architectures

Brief Summary Text (4):
The fibre channel ("FC") is an architecture and protocol for a data communication network for interconnecting a number of different combinations of computers and peripheral devices. The FC supports a variety of upper-level protocols, including the small computer systems interface ("SCSI") protocol. A computer or peripheral device is linked to the network through an FC port and copper wires or optical fibres. An FC port includes a transceiver and an interface controller, and the computer peripheral device in which the FC port is contained is called a "host." The FC port exchanges data with the host via a local data bus, such as a peripheral computer interface ("PCI") bus. The interface controller conducts lower-level protocol exchanges between the fibre channel and the computer or peripheral device in which the FC port resides.

Brief Summary Text (7):
With the advent of the FC, client computers, server computers, and mass storage devices may all be symmetrically interconnected by a single communications medium. The traditional client/server architecture is commonly ported to the FC using the same type of client/server protocols as are used in the LAN and SCSI networks discussed above. Implementing a client/server architecture using these client/server protocols introduces significant inefficiencies in data transfer with concomitant increases in I/O latency and loss of fibre channel throughput. Designers and manufacturers of fibre channel ports that are used to interconnect mass storage devices, client computers and server computers, have recognized the need for designing new client/server protocols that are better suited to take advantage of the FC.

Brief Summary Text (9):
The present invention provides a fibre channel ("FC") interface controller that supports, in hardware, efficient client/server data transfer protocols, and provides a method for implementing the efficient data transfer protocols. The interface controller of the present invention supports the forwarding of a read or write command from a server computer to a mass storage device such that the identification contained in the forwarded data transfer command is that of the client computer, rather than the server computer that forwards the data transfer command. The interface controller

also supports copying of the source identification contained in data and status messages sent by a mass storage device to a client computer in response to the data transfer command automatically into the data structure that is used by the interface controller to check correspondence between the destination identification associated with a data transfer command issued by the client computer and the source identification of data messages and status messages received back by the client computer in response to the data transfer command. These two features of the interface controller enable the data transfer protocol of the present invention. In the data transfer protocol, a server computer, in response to receiving a read command from a client computer, forwards the read command to a target mass storage device, which, in turn, transmits the data requested by the read command and a final status message directly back to the requesting client computer. In response to a write command received by a server computer from a client computer, the server computer forwards the write command to a target mass storage device. The target mass storage device sends a transfer ready status message directly to the client computer, receives, directly from the client computer, the data to be written to the mass storage device, and finally sends a status message directly back to the client computer. This improved data transfer protocol eliminates unnecessary storing and forwarding of data by the server computer and eliminates the transfer of redundant data messages and status messages within the communications network.